United States Global Change Research Program

United States Global Change Research Program Interagency Group on Integrative Modeling

August 25, 2011

USGCRP Interagency Group on Integrative Modeling (IGIM) Purpose and Scope

- Interagency cooperation to foster the development of next generation climate system models and projections, including:
  - Earth System Models (ESM)
  - Intraseasonal to decadal prediction
  - Impact, Adaptation, and Vulnerability (IAV) Models
  - Integrated Assessment models (IAM)
- Improve and define the effectiveness and productivity of Federal climate model research and development
- Engagement with National Research Council committee on “A National Strategy for Advancing Climate Modeling”

USGCRP IGIM Membership, Structure, and Roles

- Chair: Chet Koblinsky (NOAA)
- Two co-chairs: Anjuli Bamzai (NSF), Gary Geernaert (DOE)
- Organizational representatives from USGCRP Departments and Agencies
    - Active involvement of program managers from DOD (ONR), DOE, DOI (USGS and NPS), EPA, HHS, NASA, NOAA, NSF, USDA

USGCRP IGIM Working Topics

- Capturing the interagency, integrated modeling capacity
- Model interoperability across agencies and model types
- Performance of the national modeling effort and infrastructure

USGCRP IGIM Activities

- February 25, 2011
  - Establishment of the IGIM
  - OMB perspectives on the national modeling effort
    - Multiple modeling centers
    - Distributed, multi-agency computing centers
- March 28, 2011
  - USGCRP Strategic Plan discussion
    - Where does modeling fit into the strategic plan?
      - Principally into the “Advance Science” section; also in “Inform Decisions”
- April 25, 2011
  - Agency presentations on modeling issues, goals, opportunities for collaboration

USGCRP IGIM Activities (continued)

- May 31-June 1, 2011
  - Retreat organized around five modeling priorities identified by the Subcommittee on Global Change Research:
    - Constructing advanced **Integrated Assessment Models**, considering the dynamic interdependencies of human and natural systems, to support mitigation and adaptation analysis.
    - Advancing the understanding of the climate system through the development, evaluation, and analyses of high resolution **Earth System Models** which capture climate variability and change from global to regional and local scales.
    - Advance the development of **Impact, Adaptation, and Vulnerability** models for improved quantitative understanding of the consequences of and responses to climate change
    - Developing **flexible, interoperable, and accessible modeling frameworks** that facilitate linkages among and within the modeling paradigms and underlying communities.
    - Developing **uncertainty characterization** methodologies both to advance the science of models and to provide stakeholders with the value of climate projections.
- August 15, 2011
  - Update from National Research Council committee on "A National Strategy for Advancing Climate Modeling"
  - Mapping federal modeling capabilities – Bob Vallario, DOE
  - Framework document based upon the five SGCR modeling areas – Gary Geernaert, DOE

Mapping federal modeling capabilities

Anthropogenic Drivers and Human and Environmental Impacts, Adaptations, Vulnerabilities

Sectoral
- Energy
- Transportation
- Urban
- Agriculture
- Forestry
- Other land Use
- Health
- National Security
- Rural
- Coastal infrastructure
- Industrial
- Ecosystem services
- Water Use and Management
- Business and services
- Science and technology

Regional
U.S. regions
Islands
International

Behavioral and Institutional
Economics
Decision-making under uncertainty
Environmental justice
Cultural/behavioral
Institutional and governance

Modeling Component and System Focus

Earth Systems & Climate

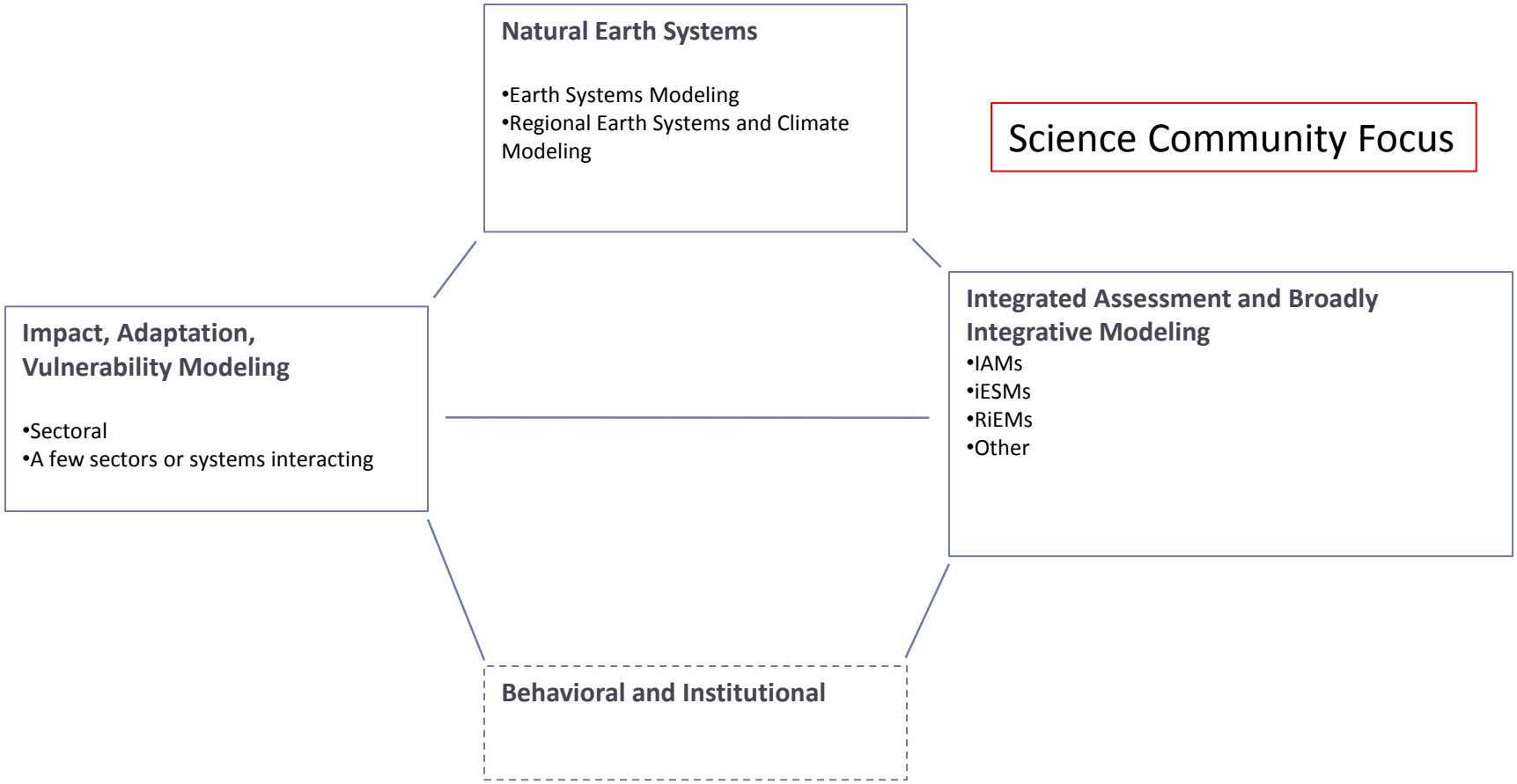
Global Components
- Global atmosphere
- Global ocean
- Global land
- Land and Sea Ice

Regional Components
- Regional air
- Regional hydrology and river routing
- Natural ecosystems
- Regional marine
- Arctic
- Coastal
- Land cover and soils
- Regional carbon cycle

Weather Phenomenon and Other Climate Related Environmental Impact Drivers

Components
- Storm frequency, intensity, duration (hurricanes, monsoons, etc.)
- Storm surge frequency , intensity, duration
- Precipitation frequency, form, intensity and duration
- Drought frequency, intensity, and duration
- Temperature distribution and durations
- Sea level rise – subsidence, storm surge, sea ice melting, rainfall flooding of coastal estuaries
- Icing events – frequency, intensity, duration

Mapping federal modeling capabilities



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Mapping federal modeling capabilities

Target User Communities

Decision-Support

Fundamental System Understanding

National Policy

State and Local Policies

Agency Operational Missions

Other Resource Management

- **State and local governments**
- **Private Sector**
- **NGOs**
- **Other**

R&D Priority Setting

Inter-Science Community

Intra-Science Community

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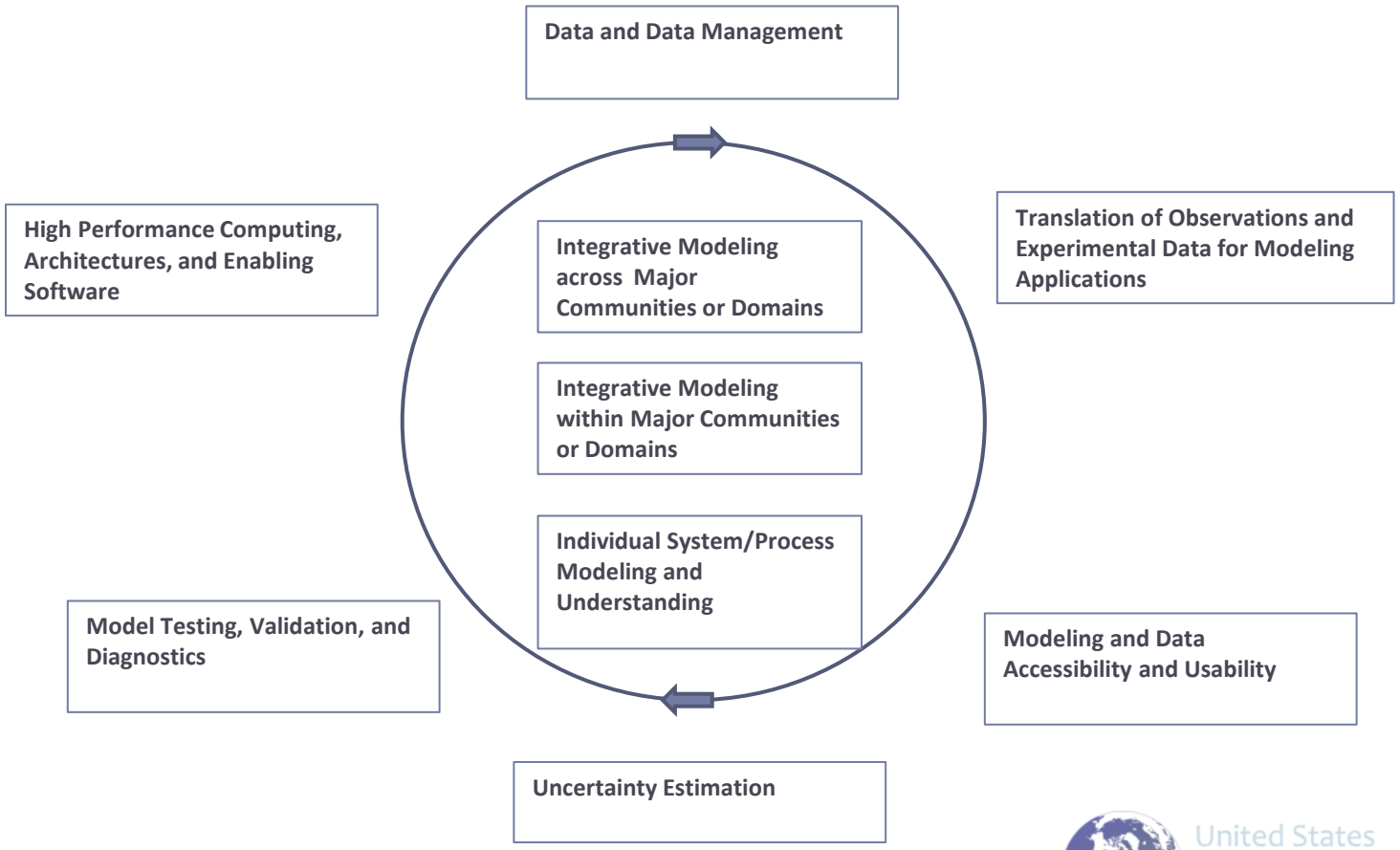
Mapping federal modeling capabilities

Modeling "Stages" and Process Capacity



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